

Application Serial No. 09/855,
Response Dated July 16, 2003
Reply to Office Action of April 16, 2003

REMARKS

This Amendment is submitted in response to the Office Action dated April 16, 2003, wherein the Examiner rejected claims 1 -5, all of the claims pending in this application. Applicants respectfully request reconsideration in light of the amendments and remarks herein. Claims 1-5 are pending in the subject application. Applicants propose to amend claim 1 to change the number of carbon atoms in the side alkyl chains to range from 3 to 5, from the previously claimed range of 2 to 7. Support for the proposed amendment to claim 1 can be found on page 6 of the Specification, lines 15 to 16, which states that side chains R¹, R², R³, and R⁴ represent alkyl groups "preferably having 3 to 5 carbon atoms". Accordingly, no new matter has been entered and Applicants respectfully request entry of this Amendment.

Prior to addressing the rejections set forth in the Final Rejection, Applicants take this opportunity to set forth the following brief remarks in connection with their invention, which relates to a magnetic recording medium for high-density recording. As discussed in the specification, the sliding action of the recording medium against the magnetic head, which is a common method of using magnetic recording media, can cause contamination of the magnetic head as material from the medium becomes deposited on the head. With the increase in sliding speed between the magnetic recording medium and the magnetic head, there is an increased need for a recording medium which has higher durability and higher resistance to wear or damage, so that it has higher resistance to higher speed sliding movement.

It is common in the art to use magnetic recording media that incorporate a lubricant, but this has also proven to be inadequate, since most lubricants do not have sufficiently high

Application Serial No. 09/855,
Response Dated July 16, 2003
Reply to Office Action of April 16, 2003

information storage properties and have low resistance to damage or wear. Thus, these products tend to have low durability and inferior electromagnetic information transfer characteristics.

The invention provides a high-density magnetic recording medium, comprising a lubricant of specific chemical structure for the purpose of achieving high durability and high resistance to damage and wear as well as high electromagnetic information transfer characteristics. By adding a tetraester compound, as described more particularly in claim 1, at least to the primer layer and coating the primer layer with a magnetic layer, a magnetic recording medium having high durability under high temperature and high speed operation can be obtained.

Rejection Under 35 U.S.C. 102 and 103(a)

The present invention is not anticipated by Sasaki et al., (US 6,165,581)

In sections 2 and 3 of the Office Action the Examiner rejected claims 1-5 under 35 USC §102 and §103(a) as being anticipated by and/or rendered obvious over U.S. Patent No. 6,165,581 to Sasaki et al. (Sasaki). Applicants respectfully traverse these rejections and request reconsideration in light of the amendment and remarks set forth herein.

According to the Examiner, Sasaki discloses "a recognizable small class of compounds having common properties which embrace the claimed compounds". The Examiner states that the general structure claimed in the application is of the same formula as Sasaki Example 3, and that Sasaki suggests the formula of the then pending claims, which allegedly included side chains of $R = C_7H_{15}$. However, Applicants respectfully assert that Sasaki does not teach or suggest the media of the amended claims.

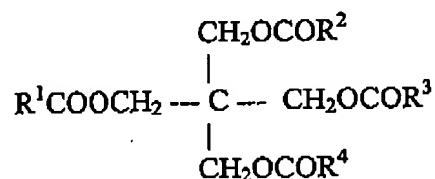
Application Serial No. 09/855,
 Response Dated July 16, 2003
 Reply to Office Action of April 16, 2003

Applicants propose to amend claim 1 herein, thereby rendering the rejection moot. Claim

1, as amended, reads:

1. A magnetic recording medium, comprising a primer layer containing at least nonmagnetic powder on a support member and at least one layer of magnetic layer containing ferromagnetic powder dispersed in a binder, the magnetic layer being placed on the support member, wherein the primer layer comprises at least one type of compound expressed by the following general formula (1);

General formula (1)



where R^1 , R^2 , R^3 , and R^4 each represents an alkyl group having 3 to 5 carbon atoms.

Accordingly, the application claims the tetraester compound of claim 1 wherein each R represents an alkyl group having 3 to 5 carbon atoms. The pentaerythritol tetradecanate of Example 3 of Sasaki contains side chains of C7 and C9, namely C_7H_{15} and C_9H_{19} , which is a different compound from the tetraester of the application with sides chains of C3 to C5. Applicants respectfully assert that Sasaki fails to describe or suggest the invention, more specifically, media as claimed including a tetraester compound having alkyl side chain with C3-C5, and therefore does not anticipate the amended claim.

Applicants also respectfully submit that amended claim 1 is not obvious over Sasaki. As described in column 3, lines 1-8, Sasaki provides a "high density magnetic recording medium capable of preventing migration of a lubricant to mechanical parts such as a liner and having long lasting lubricating performance and running performance, as well as a manufacturing

Application Serial No. 09/855,
Response Dated July 16, 2003
Reply to Office Action of April 16, 2003

method thereof." Sasaki does not, however, describe addressing the objectives of the application, which are "high durability and high resistance to damage and wear and good electromagnetic transfer characteristics" of a recording medium. Support can be found *inter alia* in the Specification, as filed, at page 5, line 22 thru 27.

The tetraester compound of the application has a high ester group concentration in the lubricant and is easily mixed with the binder. Therefore, even when the molecule becomes bigger, the fluid lubricating property is not decreased due to the increase in viscosity. Thus, the tetraester compound has high smoothness during calender processing, and can provide high durability, particularly in high-speed durability at high temperature. Sasaki, on the other hand, does not describe high calender moldability, high durability especially in high temperatures, and high electromagnetic transfer characteristics. Moreover, Sasaki does not describe a tetraester compound having an alkyl side chain of C3 to C5 as lubricant. Rather, the goal of the Sasaki was to prevent "migration of a lubricant to mechanical parts". Since Sasaki's objective and compounds used are fundamentally different from that of the application, a person of ordinary skill in the art therefore would not have found it obvious to substitute the tetraester compound for pentaerythritol tetradecanate to obtain the desired objective of the application.

In section 3 of the Office Action, the Examiner states that no comparative evidence has been submitted displaying the beneficial properties of the application over the prior art. However, Applicants respectfully submit that the application as filed does contain evidence of unexpected benefits, which further support the showing of nonobviousness. Applicants respectfully turn the Examiner's attention to Table 2 at page 38 of the Specification, as filed. Table 2 demonstrates the beneficial properties of the tetraester of the claim for achieving notably

Application Serial No. 09/855,
Response Dated July 16, 2003
Reply to Office Action of April 16, 2003

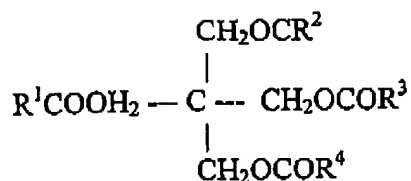
higher electromagnetic transfer characteristics, durability, and smoothness after calender molding. For example, Example 4, where the alkyl group had 5 Carbon atoms, showed electromagnetic transfer characteristics of 1.6 S/N(dB), durability of 1500 hours at 25°C and 50% relative humidity (RH) and 1500 hours at 50°C and 50% RH. Its calender moldability results were an average roughness Ra of 11.5 nm after coating and 2.6 nm after calendering. In contrast, when this 5 Carbon atom side group material is not included, in for example, Comparative example 1, the results were significantly different. Comparative example 1's electromagnetic transfer characteristics was 0 (versus 1.6) S/N(dB), durability was 123 (versus 1500) hours at 25°C and 50% RH and 31 (versus 1500) hours at 50°C and 50% RH. Its calender moldability results were an average roughness Ra of 12.3 (versus 11.5) nm after coating and 4.2 (versus 2.6) nm after calendering. These improved properties in creating a smooth durable medium after processing are in no way evident from Sasaki, which does not describe or suggest that the tetraester compound of the claims would lead to these improvements.

Accordingly, Applicants respectfully submit that the application is not anticipated or rendered obvious by Sasaki and request that the Examiner reconsider and withdraw the rejection of claims 1-5 under 35 U.S.C. §102 and §103(a).

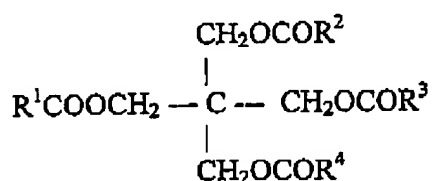
Informality in prior amendment

Applicants take this opportunity to bring to the Examiner's attention that there was an inadvertent and minor informality in the Amendment Responsive to September 30, 2002 Office Action, filed March 31, 2003. Claim 1, which was listed as not amended, and was not intended to be amended, inadvertently described the following compound:

Application Serial No. 09/855,
 Response Dated July 16, 2003
 Reply to Office Action of April 16, 2003



As corrected herein and recited in the specification and claims as originally filed, the compound of claim 1 should read as follows:



Applicants respectfully assert that this typographical error was not meant to change the claim or limit its scope in any way. Also, it does not appear that this minor informality had any effect on the examination of the application.

Applicants respectfully assert that the amendment to the claim and the above remarks put the application in condition for allowance, and accordingly, entry thereof is respectfully requested. In the event the Examiner does not consider the amendments and remarks to place the application in condition for allowance, the Examiner is respectfully requested to enter the proposed amendments in order to place the application in better condition for appeal. In this event, the Examiner is respectfully requested to telephone the undersigned in an effort to resolve any outstanding issues.

Application Serial No. 09/855,
Response Dated July 16, 2003
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No fee is deemed necessary in connection with the filing of this Amendment. However,
if any additional fee is required, such fee may also be charged to Deposit Account No. 19-4709.

Early and favorable action in the above-identified application is respectfully requested.

Respectfully submitted,

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